Assessing Substance Abuse Treatment Needs among the Homeless: A Telephone-Based Interactive Voice Response System

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ABSTRACT

Objectives. We report on a pilot project that used a telephone-based interactive voice response system, accessed by cellular phones at diverse sites, to interview homeless persons on their need for alcohol and other drug treatment.

Methods. Using this technique, we surveyed 207 homeless adults at eight shelters in Cleveland, Ohio.

Results. The cellular approach was comparable to human-administered interviews in reliability and validity and yielded higher self-reported levels of drug use.

Conclusions. Cellular telephones and interactive voice response interviewing systems can be useful tools in assessing for the health-service needs of difficult-to-reach populations. (*Am J Public Health.* 1996;86:1626–1628)

Introduction

Substance abuse remains the most prevalent health problem among the homeless.[1–4] Most studies of hidden populations draw from single sites and utilize convenience samples yielding a wide discrepancy in the reported prevalence of risk behaviors.[1]

There are many reports that support the use of computerized interviewing systems (keyboard to personal computer applications)[5–17] and several studies that support the use of interactive voice response systems ("talking computers" that ask questions and allow response by touch-tone reply).[18–21]

The purpose of the study was to test the feasibility of using cellular telephones and an interactive voice response system to assess substance abuse treatment needs in a homeless population. The reliability and validity of self-reported drug risk behaviors are examined.

Methods

Outreach workers (with experience working with homeless populations) conducted interviews at eight sites in Cleveland, Ohio, serving homeless adults: four emergency shelters, three meal sites, and one health care clinic. The research sample represents a subsample of homeless who actually accessed beds at night and a subsample living on the streets at night using daytime services. Data were collected 1 day per week at each site for 7 weeks. Respondents were selected through a lottery system (all interested individuals placed their names in a hat and there was a drawing) and were compensated for the interviews. This method was used in order to limit the data collection period at each site to 2 hours per day (usually after dinner or before the meal service) as requested by the administrators. With the use of four cellular telephones, approximately 10 interviews were conducted at each site per hour. After obtaining informed consent (forms were read aloud and respondents were asked to sign a written consent form), the outreach worker used the cellular telephone to call into the interviewing system. This was done in as quiet an area as possible, usually an administrator's office, a quiet hallway, or the corner of a large room. After placing the call, the outreach worker handed the telephone to the respondent, who replied to the questions by touch-tone. Respondents were then asked to return to the shelter in 1 week and were reinterviewed with the interactive voice response system and by the outreach worker on several key items. Respondents were also asked to provide a hair sample that would be tested for drug use.

The average interactive voice response interview lasted 25 minutes and administered the National Technical Center for Substance Abuse Needs Assessment, Telephone Substance Dependence Questionnaire, Version 5.1. This instrument leads to a lifetime diagnosis for substance abuse as described in the revised third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R).

Results

The final sample consisted of 207 adults (ages 18 and over). The majority of

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TABLE 1—Alcohol and Drug Profile of Homeless Respondents (n = 207) at Eight Service Sites in Cleveland

	%	No.
Alcohol use history		
Ever had a drink	99.5	206
Ever gone on binges	50.2	104
Ever had a drinking problem	53.6	111
Alcohol use (past 18 months)		
Had a drink in the past 18 mo	86.5	179
Drinking-related injury	25.6	53
Drinking in a risky situation	28.0	58
Average drinks per drinking day[a]		
1–2	23.8	38
3	19.5	31
4	10.1	16
5 or more	46.6	94
Alcohol[b]		
Abuse/mild dependence	1.5	3
Moderate dependence	15.5	32
Severe dependence	40.1	83
Drug use history		
Ever used marijuana	85.5	117
Ever used hallucinogens	40.1	83
Ever used crack	69.6	144
Ever used powdered cocaine	66.2	137
Ever used stimulants	37.2	77
Ever used sedatives	30.0	62
Ever injected	22.7	47
Drug use (past 18 mo)		
Used marijuana	60.9	126
Used hallucinogens	40.1	83
Used crack	61.4	127
Used powdered cocaine	34.8	72
Used stimulants	16.9	35
Used sedatives	30.0	62
Marijuana[b]		
Abuse/mild dependence	1.4	3
Moderate dependence	11.1	23
Severe dependence	4.8	10
Crack/cocaine[b]		
Abuse/mild dependence	0.5	1
Moderate dependence	23.2	48
Severe dependence	21.3	44
Heroin[b]		
Abuse/mild dependence	0	0
Moderate dependence	2.4	5
Severe dependence	3.4	7
Drug or alcohol treatment: ever been in treatment	47.3	98

[a]Of those drinking in the past 18 months.
[b]Lifetime diagnosis based on the level of drinking or using drugs (past 18 months), as specified in the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., rev.

TABLE 2—Reliability of Self-Reported Drug Use in the Past 18 Months by Homeless Respondents (n = 157) in Cleveland

	Test–Retest Agreement			Computer–Human Agreement
	Any Use		Times Used,	
Drug Used	% Agreement	Kappa	Pearson's *r*	% Agreement
Marijuana	83	0.65	0.74	81
Powdered cocaine	92	0.74	0.47	80
Crack cocaine	84	0.69	0.71	91
Heroin/opiates	96	0.91	0.71	95

TABLE 3—Validity of Self-Reported Cocaine Use in the Past 30 Days by Homeless Respondents (n = 157) in Cleveland

		Hair Assay Result		
Method of Interview	Self-Report Result	Positive	Negative	Total
Interactive voice response (via cellular phone)	Negative	23 (31%)	44 (91%)	67 (55%)
	Positive	51 (69%)	4 (9%)	55 (45%)
Concordance				95/122 (78%)
In person with outreach worker	Negative	28 (38%)	48 (98%)	76 (62%)
	Positive	46 (62%)	1 (2%)	47 (38%)
Concordance				94/123 (76%)

respondents were male (76%), Black (77%), unemployed (64%), with a total family income of less than $10 000 per year (56%), and not married (93%). More than half of the sample had completed high school (57%). Self-perceived health status indicated that many respondents felt that their physical health was fair or poor (43%) and that their emotional health was fair or poor (62%).

Alcohol and Drug Profile

Results for the alcohol and drug profile of the sample are presented in Table 1. Over half of the sample (54%) reported ever having had a drinking problem. The DSM-III-R lifetime diagnosis for alcohol abuse and dependence indicated that 57% of the sample were alcohol abusers or alcohol dependent. Of those diagnosed as abusing or dependent, virtually all respondents fell within the moderate or severe dependence category.

Of the drugs ever used, marijuana was the most common (86%). Crack, however, is clearly the drug most often used in the recent past (51% in the past 30 days). The DSM-III-R lifetime diagnosis for drug abuse and dependence indicated that 45% of the sample were abusers of or dependent on crack or cocaine, 17% were abusers of or dependent on marijuana, and 6% were abusers of or dependent on heroin.

Almost half of the sample reported having ever been in alcohol or other drug treatment (47%), and 30% had been in treatment in the past year. An additional 35% indicated that they would have sought treatment if it had been available.

Reliability and Validity of Responses

For the second interview, a follow-up sample of 157 respondents returned (response rate of 76%), and 128 (82% of 157) provided a hair sample. Reliability and validity results are presented in Tables 2 and 3.

The responses in the second interview were compared with the responses obtained 7 days earlier at baseline. Rates of agreement for all drugs were quite high, and kappa was moderate. Pearson's *r* showed only moderate correlation in the number of times a particular drug was reportedly used. The comparison of the interactive voice response interview and the human-administered interview revealed fairly high rates of agreement. Overall, there was higher self-reported drug use for all drugs on the interactive voice response interview.

Hair samples were tested for five drugs, cocaine, marijuana, opiates, PCP, and methamphetamines, when the hair was sufficient. Results for cocaine (the most common drug of use) indicate that of those who admitted use (in either interview), nearly all were confirmed by hair assay. Of those who denied use in the last 30 days, about one third tested positive for cocaine use. Further, of those testing positive by hair assay, about one third denied cocaine use. These results are consistent for both the interactive voice response interview and the human interview.

Discussion

This methodology holds considerable promise for accessing difficult-to-reach populations. Only two respondents in our sample had difficulty using the telephone keys to respond to questions. We found that the advantages of cellular self-administered interactive voice response interviewing include 100% reliable delivery of questions (computers do not forget to ask questions), a context that is possibly less embarrassing and less threatening (e.g., there was no risk of losing a bed because of the self-report of drug use), no coding or data entry costs, and the ability to perform needs assessment on a citywide group of respondents. Further, there is some evidence that there is greater disclosure of risk behaviors using this methodology. The approach seems cost effective since the outreach worker needs little training and many simultaneous interviews can be performed by one outreach worker. No telephones were stolen or damaged during the study period.

The system is not without disadvantages. Our study lacked the ability to accept open-ended responses. Also, since responses are given to the computer, the outreach worker cannot tailor an intervention to the individual's needs.

In sum, it is possible that a methodology that allows 24-hour access to interviewing and uses existing shelter staff or outreach workers will lead to more representative sampling of hidden populations. □

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